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The Arctiini (Lepidoptera, Erebidae, Arctiinae) fauna of the Serra do Pardo National Park, Pará, Brazil

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Abstract: This study evaluated the Arctiini fauna of the Serra do Pardo National Park (Pará, Brazil) between 22 September and 3 October 2011. Light traps were left one night in each sampling site (SS) from 18:00 h to 6:00 h of the next day. The following parameters were evaluated: richness (S), abundance (N), diversity index (H'), Shannon uniformity (U) index, and Berger-Parker dominance (BP). Richness was estimated using the non-parametric methods Chao1, Chao2, ACE, ICE, Jackknife1, Jackknife2 and Bootstrap. A total of 3,247 specimens were captured, belonging to 221 Arctiini taxa; 32 of these are new records for the state of Pará and, of these, six are new records for the Brazilian Amazon. The Arctiini fauna is very rich and uniform. The richness estimator and rarefaction curve indicated the need for increased sampling efforts in the area.

Key words: Amazon, diversity, moths, Noctuoidea

INTRODUCTION

The greatest diversity of species is found in tropical forests, despite the fact that they cover less than 7% of the earth's surface (Primack and Rodrigues 2001). Within tropical forests, we highlight the Amazon rainforest, which offers refuge for approximately 40,000 species of plants, 427 species of mammals, 1,294 species of birds, 378 species of reptiles, 427 species of amphibians, 3,000 species of fish, 3,000 species of bees, 500 species of spiders, 1,800 species of butterflies, 200 species of millipedes, 3,000 species of ants, 220 species of wasps, and 100 species of earthworms (Overal 2001; Silva and Garda 2011). Even though the ecology of the Amazon rainforest has been intensively studied in the last decades, it is estimated that 70% of the species of this biome remain to be cataloged. Considering the current inventory rate, this situation will persist for a long time (Salati et al. 2006).

The Amazon rainforest has undergone several threats in the last decades; for instance, human activities such as large-scale agriculture, exploitation of natural resources, and farming of livestock have negatively impacted the forest. The most significant threat to the conservation of the Amazon is loss of habitat (Fearnside 2005).

The creation of protected areas (PAs) has been a fundamental strategy for the in situ preservation of nature. PAs have slowed down deforestation, which is more intense along the southern and eastern borders of the Amazon region, and have mitigated land-use pressures such as illegal deforestation, irregular occupation of land, and construction of hydroelectric dams resulting from increased demand from the energy sector (Bernard et al. 2014).

According to Capobianco et al. (2001), the interfluve region of the Xingu/Iriri, where the Serra do Pardo National Park (SPNP) can be found, is a biodiversity hotspot under great anthropogenic pressure from the logging industry.

Lepidopterans are among the main insect orders, distinguishing themselves by their species richness, their economic importance, and their utility in biodiversity studies. This last characteristic is due to the phytophagous eating habits of their larvae, which can be used as bioindicators of vegetation quality in a given area (Kitching et al. 2000; Teston et al. 2006). Adults are usually collected with the help of light traps, of which there are many different models (Camargo 2001; Teston et al. 2006).

Among lepidopterans, the nocturnal Arctiini (Erebidae, Arctiinae) are one of the most used for monitoring ecosystems (Hilty and Merenlender 2000). Many studies have documented their importance, since they are

well-known and relatively easy to identify and capture (Hilt and Fiedler 2005, 2006; Brehm and Axmacher 2006; Brehm 2007; Hilt et al. 2007; Conner 2009; Hawes et al. 2009; Teston and Delfina 2010; Teston et al. 2012; Delfina and Teston 2013). In the Neotropical region, there are 4,761 species of Arctiini (Heppner 1991), and Brown Jr. and Freitas (1999) estimate the occurrence of at least two thousand species in Brazil. The state of Pará alone has 497 recorded species (Delfina and Teston 2013). Recently some studies on the Arctiini fauna were undertaken in this state (Hawes et al. 2009; Teston and Delfina 2010; Teston et al. 2012; Delfina and Teston 2013); however, none of them in a PA.

With the objective of contributing to a greater understanding of Arctiini diversity in the Brazilian Amazon, primarily in PAs, a survey of the species of this lepidopteran tribe was undertaken in the Serra do Pardo National Park (SPNP), Pará, Brazil. Until the present study, there were no records of the occurrence of Arctiini species in the entire Terra do Meio region (Pará, Brazil), including the SPNP. Recently, political pressure has been put on the Serra do Pardo National Park and five other federal conservation units to reduce their coverage, their degree of protection, and even their conservation status (Bernard et al. 2014).

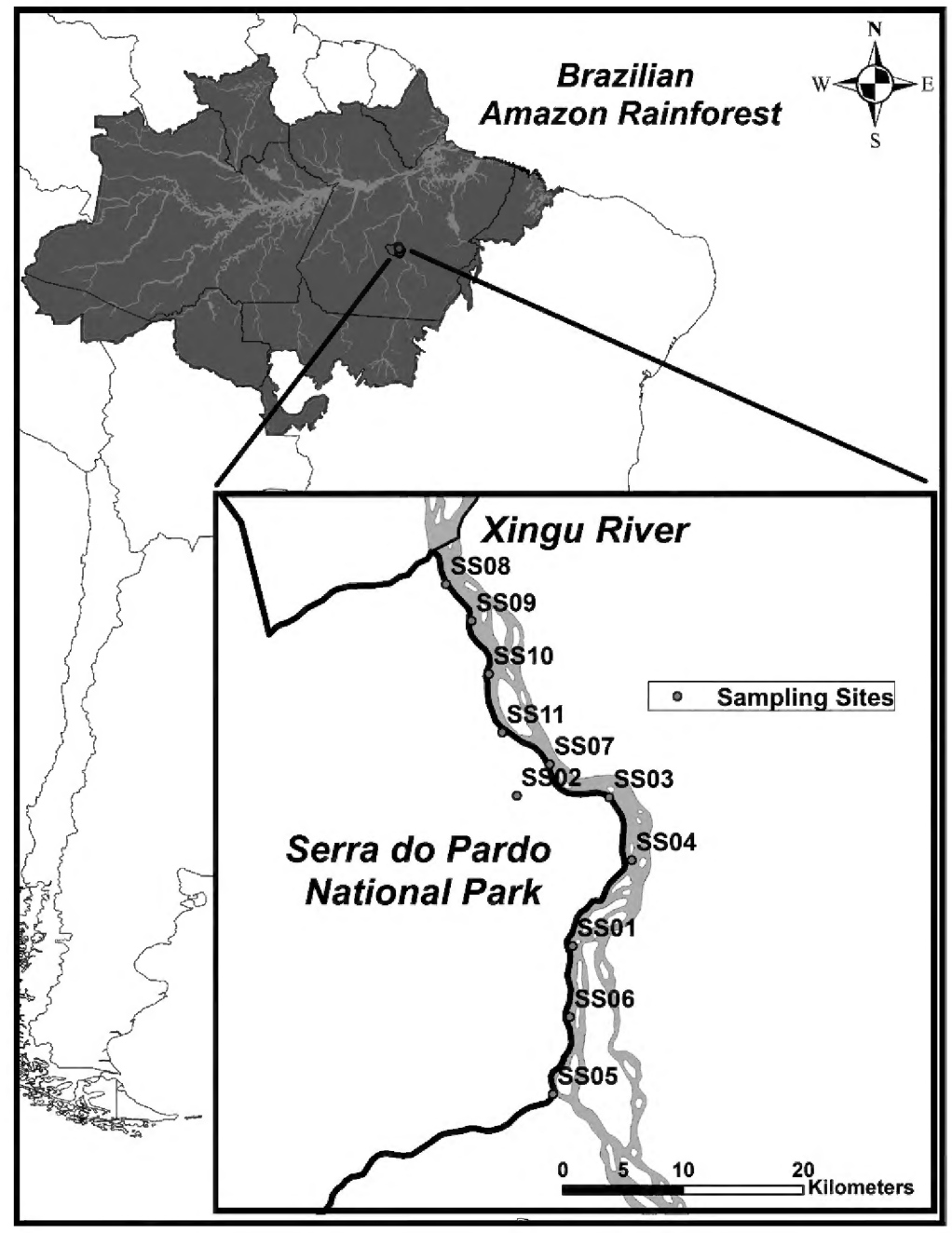

Figure 1. Location of the Serra do Pardo National Park and respective sampling sites (SS).

MATERIALS AND METHODS

The Serra do Pardo National Park (SPNP), a conservation unit maintained by the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio), was created by the Decree of February 17, 2005. With an area of 445,392 ha, it is nested in the municipalities of Altamira and São Félix do Xingu, in the region known as Terra do Meio occupying the midwestern portion the state of Pará. It is limited to the north by the Rio Xingu Extractive Reserve, to the northwest by the Terra do Meio Ecological Station, to the west and south by the Triunfo do Xingu Environmental Protection Area, and to the east by the Xingu River and Apyterewa Indigenous Land, on the right margin of the river. The vegetation consists of open and dense sub-mountain rainforest and cerrado (Fávaro 2011).

Collecting was conducted from 22 September to 3 October 2011, totaling 11 sampling events in 11 localities (one sampling event in every location sampled) (Figure 1 and Table 1). To that end, L-shaped light traps (2.0 m in width and 1.5 m length) were made with two white sheets. The moths were captured with killing jars containing ethyl acetate or ammonia. Two mixed-lamps (250 watts) powered by a portable electric generator (Camargo 2001), one on each cloth, were used to attract them. The traps were left on all night, from 18:00 h to 6:00 h of the following day, in a total sampling effort of 12:00 h in every sampling site (SS).

The captured Arctiini were separated, counted, and recorded in specific worksheets for every location in the Museu de Zoologia (MZSTM) and the Laboratório de Estudos de Lepidópteros Neotropicais (LELN) of the Universidade Federal do Oeste do Pará (UFOPA). Representative samples of every species (voucher) were prepared following the traditional method for Lepidoptera, and subsequently incorporated into the laboratory collection (LELN).

Species identification was undertaken using reference works (Hampson 1898, 1901, 1914, 1920; Draudt 1915–1917; Seitz 1915–1925; Hering 1925; Watson 1971,

Table 1. Sampling site with light traps during the expedition to the Serra do Pardo National Park, Pará, Brazil, with their respective geographic coordinates, altitude, and sampling dates (night from 18:00 h as 6:00 h).

Sampling site (SS)	Geographic Coordinates		Altitude (m)	Date (night)
SS01	05°54′37.6″ S	052°36′11.3″ W	163	22-23/IX/2011
SS02	05°47′52.0″ S	052°38′42,2″ W	180	23-24/IX/2011
SS03	05°47′56.5″ S	052°34′32.9″ W	161	24-25/IX/2011
SS04	05°50′45.6″ S	052°33′32.0″ W	155	25-26/IX/2011
SS05	06°01′15.9″ S	052°37′04.3″ W	182	26-27/IX/2011
SS06	05°57′48.2″ S	052°36′18.7″ W	162	27-28/IX/2011
SS07	05°46′26.4″ S	052°37′13.1″ W	194	28-29/IX/2011
SS08	05°38′21.9″ S	052°41′52.1″ W	160	29-30/IX/2011
SS09	05°40′00.7″ S	052°40′43.1″ W	182	30/IX - 01/X/2011
SS10	05°42′23.8″ S	052°39′56.2″ W	177	01-02/X/2011
SS11	05°45′01.6″ S	052°39′20.6″ W	163	02-03/X/2011

1973, 1975, 1980) and by comparison with specimens deposited in the collection of the Instituto Nacional de Pesquisas da Amazônia (INPA), Museu Paraense Emílio Goeldi (MPEG), and Laboratório de Estudos de Lepidópteros Neotropicais (LELN). When necessary, identification was made after dissection and preparation of the male genitalia.

The taxonomic classification adopted and allocation of species to genera follows Vincent and Laguerre (2014) for the subtribes Arctiina, Callimorphina, Phaegopterina, Pericopina, and Spilosomina, and Hampson (1898), Watson et al. (1995), and Weller et al. (2000) for Ctenuchina and Euchromiina.

In order to compare among sampling sites (SS), a list of the occurrence and abundance (N) of Arctiini was organized in alphabetical order by subtribe, genus, and species. Richness (S), diversity (H') and uniformity (U) Shannon indexes, Berger-Parker dominance (BP) (Magurran 2011), and estimate of species richness by the non-parametric methods Chao1, Chao2, ACE, ICE, Jackknife1, Jackknife2 and Bootstrap, using the program EstimateS (version 9.1.0) (Colwell 2013), are also presented.

RESULTS

In total, 3,247 specimens (N) were captured, distributed in 221 species (S) and representing all seven Arctiini subtribes (Table 2).

The most abundant Arctiini (above 100 specimens collected) were: *Calonotos aequimaculatus* Zerny, 1931; *Calonotos triplaga* Hampson, 1909; *Cosmosoma telephus* (Walker, 1854); *Cosmosoma teuthras* (Walker, 1854); *Melese drucei* Rothschild, 1909; *Metaloba argante* (Druce, 1897); *Poecilosoma eone* (Hübner, 1827) and *Poliopastea plumbea* Hampson, 1898.

The Shannon diversity index (Table 3) calculated for the entire sample was H'= 3.77, with uniformity U= 0.698. As expected, this high value is accompanied by a very low Berger-Parker dominance index (BP= 0.169).

All of the richness estimators (Table 4) point to an increase in the number of Arctiini species in the SPNP. In this study, between 86% (Bootstrap) to 68% (Jackknife2) of the total expected species were captured.

DISCUSSION

The number of species captured corresponds to 45% of the total known for the state, according to Delfina and Teston (2013). A total of 32 species are new records for the state of Pará (denoted by an asterisk in Table 2), bringing the number of recorded species to 531. From these, six are new records for the Brazilian Amazon: *Biturix obscura* (Hampson, 1898), *Lepidokirbyia venigera* Toulgoët, 1982, *Pelochyta draudti* (Seitz, 1922), *Scaptius asteroides* (Schaus, 1905), *Scaptius chrysopera* (Schaus, 1905) and *Trichromia metachryseis* (Hampson, 1905).

Only eight species represented more than half of the total abundance (56.3%). On the other hand, 69 species (30.9%) were represented only by one specimen. In past surveys, including those conducted in the state of Pará, many species of Arctiini were represented by only a few individuals (Hawes et al. 2009; Teston and Delfina 2010; Teston et al. 2012; Delfina and Teston 2013).

The relatively high values of diversity and Shannon uniformity and the low Berger-Parker dominance were expected, given the linear relationship between the two previous indexes and dominance; in other words, the lower the dominance is, the greater the diversity and uniformity will be (Magurran 2011).

The rarefaction curve of species (Figure 2) did not show an asymptote, indicating the need to enlarge the sampling effort. In the same manner, the estimators show that the observed richness varied from 68% (Jackknife2) to 86% (Bootstrap) in relation to the estimated richness, indicating that the inventory must be broadened, consistent with all recent Arctiini studies carried out in Pará (Hawes et al. 2009; Teston and Delfina 2010; Teston et al. 2012; Delfina and Teston 2013), which point to an increase in the observed richness as a function of increased sampling efforts.

Continued inventory efforts for Arctiini in the Serra

Table 2. Number of Arctiini specimens captured with light traps during the expedition to the Serra do Pardo National Park, Pará, Brazil, from 22 September to 3 October 2011. Species marked with an asterisk (*) indicate a first time record for the state of Pará.

Subtribes/Species	SS01	SS02	SS03	SS04	SS05	SS06	SS07	SS08	SS09	SS10	SS11	Total
Arctiina												
Virbia subapicalis (Walker, 1854)					7		2		2	1		12
Pseudalus sp.		1										1
Callimorphina												
Utetheisa ornatrix (Linnaeus, 1758)					1							1
Ctenuchina												
Abrochia aequalis (Walker, 1864)			1					1				2
Abrochia discoplaga Schaus, 1905		1	1					1		1	1	5
Abrochia fulvisphex (Druce, 1898)	1		1				2	1		2		7
Abrochia sp.							1	1				2
Aclytia heber (Cramer, 1780)	1	4	16		1	9	11	1	1	7	2	53
Aclytia punctata Butler, 1876			8			1	1	2	6	7	2	27

Continued

Table 2. *Continued.*

Subtribes/Species	SS01	SS02	SS03	SS04	SS05	SS06	SS07	SS08	SS09	SS10	SS11	Total
Aclytia sp.		1		1		1	2	2		3	1	11
Correbia lycoides (Walker, 1854)			8				1			1	2	12
Correbidia calopteridia (Butler, 1878)	3	1	3			1	3	3		4		18
Correbidia sp.			3								1	4
Delphyre discalis (Druce, 1905)					3	2	1				1	7
Delphyre dizona (Druce, 1898)			3		1	5		2		5	1	17
Delphyre flaviceps (Druce, 1905)		1	3		1	1	3					9
Delphyre hampsoni Rothschild, 1912 *			4									4
Delphyre sp.			2									2
Epanycles imperialis (Walker, 1854)			6			1				4	1	12
Epidesma aurimacula (Schaus, 1905)			1		1			1		1		4
Epidesma parva (Rothschild, 1912)										1		1
Epidesma ursula (Stoll, 1781)		1	3			2	3	2				11
Episcepsis endodasia (Hampson, 1898) *			4						2	1		7
Episcepsis gnoma (Butler, 1877)			2									2
Episcepsis lamia (Butler, 1877)		1	3				2					6
Episcepsis lenaeus (Cramer, 1780)	1	1	1			1	3	5		3	1	16
Episcepsis scintillans Rothschild, 1911			2							1		3
Episcepsis thetis (Linnaeus, 1771) *			1				1					2
Episcepsis venata Butler, 1877					1					2		3
Episcepsis sp.			2	1		3			1	1		8
Eucereon amazonum Rothschild, 1912		1										1
Eucereon atriguttum Druce, 1905 *		2	2				4					8
Eucereon complicatum Butler, 1877			2				1					3
Eucereon latifascia (Walker, 1856)		1										1
Eucereon marmoratum Butler, 1877	1	2								1		4
Eucereon pseudarchias Hampson, 1898		2	3			1	1	1				8
Eucereon sylvius (Stoll, 1790)			1				1					2
Eucereon tarona Hampson, 1898 *		1	1							2		4
Eucereon varia (Walker, 1854)		3	10		1	6	2	2		7	1	32
Eucereon sp. 1								1				1
Eucereon sp. 2			1									1
Eucereon sp. 3			1						2	1		4
Eucereon sp. 4		1										1
Eucereon sp. 5							1					1
Heliura balia (Hampson, 1898)										2		2
Heliura suffusa (Lathy, 1899)						1						1
Heliura tetragramma (Walker, 1854)		1	13			5	5			9	1	34
Heliura zonata Druce, 1905			1							1		2
Heliura sp.			1		1							2
Hyaleucerea erythrotela (Walker, 1854)			2				2	1		1	1	7
Hyaleucerea fusiformis (Walker, 1856)			1	2								3
Hyaleucerea leucosticta Druce, 1905			6									6
Hyaleucerea sp.			1									1
Loxozona lanceolata (Walker, 1854)			1				2					3
Pseudohyaleucerea vulnerata (Butler, 1875)	1						1			2		4
Pseudopompilia mimica Druce, 1898 *							3					3
Ptychotricos zeus Schaus, 1894	1		10			4	1	2		3		21
Telioneura glaucopis R. Felder, 1869								1				1
Theages leucophaea Walker, 1855 *										1		1
Timalus leucomela (Walker, 1856)						1	1					2
Trichura aurifera Butler, 1876								1				1
Euchromiina												
Autochloris enagrus (Cramer, 1780) *											1	1
Calonotos aequimaculatus Zerny, 1931	49	1	146	58	3	60	160	10		27	34	548
Calonotos angustipennis (Zerny, 1931)			1	1			1			2	2	7
Calonotos longipennis Rothschild, 1911 *			3		1							4
Calonotos triplaga Hampson, 1909	20	3	25	4	1	28	55	1		6	12	155
Calonotos sp.				1								1
Cosmosoma admota (Herrich-Schäffer, 1854)						2	4		2		2	10

Continued

Table 2. *Continued.*

Subtribes/Species	SS01	SS02	SS03	SS04	SS05	SS06	SS07	SS08	SS09	SS10	SS11	Total
Cosmosoma consolata (Walker, 1856)	1			1		1	3				1	7
Cosmosoma klagesi Rothschild, 1910			1							1		2
Cosmosoma metallescens (Ménétrie, 1857)			2				4	4			1	11
Cosmosoma nelea Möschler, 1877 *			1									1
Cosmosoma subflamma (Walker, 1854)		1										1
Cosmosoma telephus (Walker, 1854)	2	6	34	12		8	29	1		4	12	108
Cosmosoma teuthras (Walker, 1854)	3	1	16	1		17	60	1		3	5	107
Cosmosoma thoracica Schaus, 1905			2									2
Cosmosoma sp. 1	1		1				1					3
Cosmosoma sp. 2							1					1
Cosmosoma sp. 3				1								1
Dycladia lucetius (Stoll, 1781)			2		3	2						7
Dycladia transacta (Walker, 1856) *				1								1
Hypocharis sp.			1								1	2
Isanthrene melas (Cramer, 1775)											1	1
Isanthrene porphyria (Walker, 1854)			6			1		1		2	6	16
Isanthrene profusa Hampson, 1898	2	1	5		1	8		2		4	2	25
Isanthrene varia (Walker, 1854)	1	1	10				1	3		5	7	28
Isanthrene vespiformes (Butler, 1876)			1									1
Isanthrene sp. 1			3							1		4
Isanthrene sp. 2											1	1
Leucotmemis margariphera (Butler, 1876)							2					2
Leucotmemis nexa (Herrich Schäffer, 1854)	5	1	7			7	21	5		6		52
Loxophlebia diaphana (Sepp, [1848])			4							1		5
Loxophlebia pyrgion (Druce, 1884)		2	9			1	2	2		1		17
Loxophlebia triangulifera (R. Felder, 1869) *							1				1	2
Loxophlebia sp.			2									2
Macrocneme adonis Druce, 1884							1					1
Macrocneme lades (Cramer, 1776)	5	5	3	1		4		2			3	23
Mesothen desperata (Walker, 1856)							2	2				4
Mesothen sp. 1			1									1
Mesothen sp. 2							2					2
Metaloba argante (Druce, 1897)	17	1	51	25	1	17	44	1		9	15	181
Nyridela chalciope Hübner, 1898		1	35		1	6	2	1		6	1	53
Orcynia calcarata (Walker, 1854)	5	2	7	3		3				2	4	26
Pheia albisigna (Walker, 1854)	2	2	2			1				1		8
Pheia gaudens (Walker, 1856)	1		4	1		1	3			1		11
Pheia sp.		1					1					2
Phoenicoprocta corvica (Dognin, 1910)		2				5	7	2		3		19
Phoenicoprocta vacillans (Walker, 1856)							1					1
Pleurosoma angustatum (Möschler, 1878)							1					1
Poecilosoma chrysis Hübner, 1827			2			1						3
Poecilosoma eone (Hübner, 1827)			136	2		4	55	20	11	179	28	435
Poliopastea anthracina (Klages, 1906)							5		1	3	1	10
Poliopastea plumbea Hampson, 1898	4	3	9	5	6	31	71	4		16	19	168
Poliopastea sp.			2	6	1			4		2		15
Pseudomya picta Schaus, 1894 *									1		1	2
Psoloptera leucosticta (Hübner, 1827)		1	8	2		9	9	8	1	6	9	53
Sarosa acutior (R. Felder, 1869)									1			1
Saurita attenuata Hampson, 1905		5	3			2		1	1	2	1	15
Saurita temenus (Stoll, 1871)			1									1
Saurita tipulina (Hübner, 1827)					1							1
Saurita sp. 1										1		1
Saurita sp. 2								1		1		2
Saurita sp. 3							1				1	2
Sphecosoma sp.								2				2
Xanthopleura perspicua (Walker, 1856)	3	1	1	1		3	7	3		2	5	26
Pericopina												
Calodesma collaris (Drury, 1782)		3	4	1	4	7	4	2	1	3	2	31
Calodesma dioptis (Felder & Rogenhofer, 1874)							1					1

Continued

Table 2. *Continued.*

Subtribes/Species	SS01	SS02	SS03	SS04	SS05	SS06	SS07	SS08	SS09	SS10	SS11	Total
Chetone catilina (Cramer, [1776])			3				4					7
Dysschema tricolora (Sulzer, 1776)									1			1
Hyalurga leucophlebia Hering, 1925									1			1
Phaegopterina												
Amaxia beata (Dognin, 1909) *		1		1		2						4
Amaxia chaon (Druce, 1883)					1							1
Amaxia consistens Schaus, 1905		1										1
Amaxia erythrophleps Hampson, 1901		1						1	2			4
Amaxia flavicollis (Rothschild, 1909)							1					1
Amaxia pandama (Druce, 1893)							1		1			2
Amaxia reticulata (Rothschild, 1909)		1										1
Ammalo helops (Cramer, [1776])			3		1						2	6
Apyre separata Walker, 1854			1			1		1		1		4
Araeomolis rhodographa Hampson, 1901	1	5	14	1		7	5		1	2		36
Araeomolis sp.		1										1
Arctiarpia melanopasta (Dognin, 1907)			1							1		2
Astralarctia pulverosa (Schaus, 1905)							1				1	2
Azatrephes discalis (Walker, 1856)	1				1	2		2	4	2		12
Baritius sp.										1		1
Bertholdia detracta Seitz, 1921 *							2			1		3
Biturix obscura (Hampson, 1898) *		1				3				2		6
Carales astur (Cramer, [1777])		3						1				4
Cratoplastis diluta Felder & Rogenhofer, 1874						1		1				2
Cresera affinis (Rothschild, 1909)	1											1
Cresera ilioides (Schaus, 1905) *						1						1
Cresera optimus (Butler, 1877)		1										1
Cresera similis (Rothschild, 1909)	1			1	3	4						9
Emurena fernandezi Watson, 1975		1										1
Ernassa sanguinolenta (Cramer, [1779])							1					1
Eupseudosoma involuta (Sepp, [1855])						1					1	2
Eupseudosoma larissa (Druce, 1890)		2				3	1					6
Evius albicoxae (Schaus, 1905)								1	2	1		4
Evius sp.					1					1		2
Glaucostola sp.										2		2
Gorgonidia buckleyi (Druce, 1883)		2				1						3
Himerarctia sp.								1				1
Hyperandra novata (Dognin, 1924)									1	1		2
Hyponerita similis Rothschild, 1909	1											1
Idalus aleteria (Schaus, 1905)	4	1	1			1				2		9
Idalus carinosa (Schaus, 1905) *					1							1
Idalus critheis Druce, 1884								1		1		2
Idalus daga (Dognin, 1891)						1				1	1	3
Idalus fasciipuncta (Rothschild, 1909) *		1										1
Idalus intermedia (Rothschild, 1909)		2				2						4
Idalus vitrea (Cramer, [1780])		2	1			2	1			1	1	8
Idalus sp.							1					1
Ischnognatha semiopalina Felder & Rogenhofer, 1874		1									1	2
Lepidokirbyia venigera Toulgoët, [1983] *			1									1
Leucanopsis sp.					1							1
Lophocampa citrina (Sepp, [1852])	3	2	13	1		5	16	3	1	7	6	57
Lophocampa modesta (Kirby, 1892)		2	1			1	1			3		8
Lophocampa sp.			1									1
Machaeraptenus ventralis Schaus, 1894			1									1
Melese drucei Rothschild, 1909	4	35	26	1	8	17	13	8	2	6	5	125
Melese incertus (Walker, 1855)		6	3		1	4	3			2		19
Melese ocellata Hampson, 1901 *		1										1
Melese sp. 1					1							1
Melese sp. 2			3									3
Metaxanthia threnodes Druce, 1905 *		1										1

Continued

Table 2. *Continued.*

Subtribes/Species	SS01	SS02	SS03	SS04	SS05	SS06	SS07	SS08	SS09	SS10	SS11	Total
Munona iridescens Schaus, 1894 *								1				1
Ormetica contraria (Walker, 1854)		2		1								3
Ormetica packardi (Butler, 1876)	1	1						1		1		4
Ormetica sypilus (Cramer, [1777])						2	1					3
Pachydota albiceps (Walker, 1856) *	1	1	4				5			1	1	13
Parathyris cedonulli (Stoll, [1781])		1			1							2
Pelochyta draudti (Seitz, 1922) *								1				1
Pelochyta sp.		5	11			1	2					19
Phaeomolis polystria (Schaus, 1905)		1	6				2	1		1		11
Phaeomolis sp.			2							1		3
Premolis semirufa (Walker, 1856)							1					1
Pseudepimolis flavonotata (Rothschild, 1909)		2	1			1	1			1		6
Pseudepimolis incarnata (Hampson, 1901)						1			1			2
Psychophasma erosa (Herrich-Schäffer, [1858])	3	10	4		2	9	5			10		43
Regobarrosia flavescens (Walker, 1856)		1	1									2
Rhipha albiplaga (Schaus, 1905) *					1	1		1		1		4
Robinsonia dewitzi Gundlach, 1881						1				1		2
Robinsonia rockstonia Schaus, 1905 *			2				1	1		2	1	7
Robinsonia sanea Druce, 1895		4	1			2	3			3		13
Scaptius asteroides (Schaus, 1905) *						1			1			2
Scaptius chrysopera (Schaus, 1905) *			2		1					1		4
Selenarctia elissa (Schaus, 1892)					1							1
Sutonocrea reducta (Walker, 1856)			1									1
Trichromia albicollis (Hampson, 1905) *		4										4
Trichromia declivis (Schaus, 1905)						1						1
Trichromia metachryseis (Hampson, 1905) *							1		1			2
Trichromia metapyria (Dognin, 1907)		1					1					2
Trichromia onytes (Cramer, [1777])										1		1
Trichromia sp.									1			1
Viviennea moma (Schaus, 1905)	1	1				3	1			1		7
Viviennea superba (Druce, 1883)					1	1						2
Zatrephes crocos (Cramer, [1777]) *			2									2
Spilosomina												
Hypercompe cunigunda (Stoll, [1781])			4		1	2	1			1	1	10
Hypercompe sp.					1							1
Paracles laboulbeni (Bar, 1873)		1									3	4
Paracles sp.	1											1
Total	**145**	**176**	**810**	**138**	**69**	**359**	**699**	**140**	**53**	**439**	**219**	**3,247**

Table 3. Numbers of richness (S), abundance (N), Shannon diversity (H') Shannon uniformity (U), and Berger-Parker dominance (BP) by sampling site (SS) for Arctiini captured with light traps during the expedition to the Serra do Pardo National Park, Pará, Brazil, from 22 September to 3 October 2011.

Sampling sites (SS)	S	N	H'	U	BP
SS01	31	145	2.53	0.737	0.338
SS02	74	176	3.72	0.865	0.199
SS03	111	810	3.50	0.744	0.180
SS04	29	138	2.19	0.651	0.420
SS05	39	69	3.35	0.914	0.116
SS06	74	359	3.54	0.823	0.167
SS07	87	699	3.12	0.698	0.229
SS08	59	140	3.65	0.894	0.143
SS09	29	53	3.03	0.901	0.208
SS10	90	439	3.06	0.681	0.408
SS11	54	219	3.24	0.811	0.155
Total	**221**	**3,247**	**3.77**	**0.698**	**0.169**

Table 4. Estimates for Arctiini captured with light traps during the expedition to the Serra do Pardo National Park, Pará, Brazil. Samples, species, uniques, duplicates, singletons, doubletons and species richness by estimators Chao1, Chao2, ACE, ICE, Jackknife1, Jackknife2 and Bootstrap.

	Values	Percentage of richness observed in relation to the estimated
Samples	11	-
Species	221	-
Uniques	83	-
Duplicates	51	-
Singletons	68	-
Doubletons	41	-
Chao1	277	80%
Chao2	282	78%
ACE	290	76%
ICE	317	70%
Jackknife1	296	75%
Jackknife2	327	68%
Bootstrap	256	86%

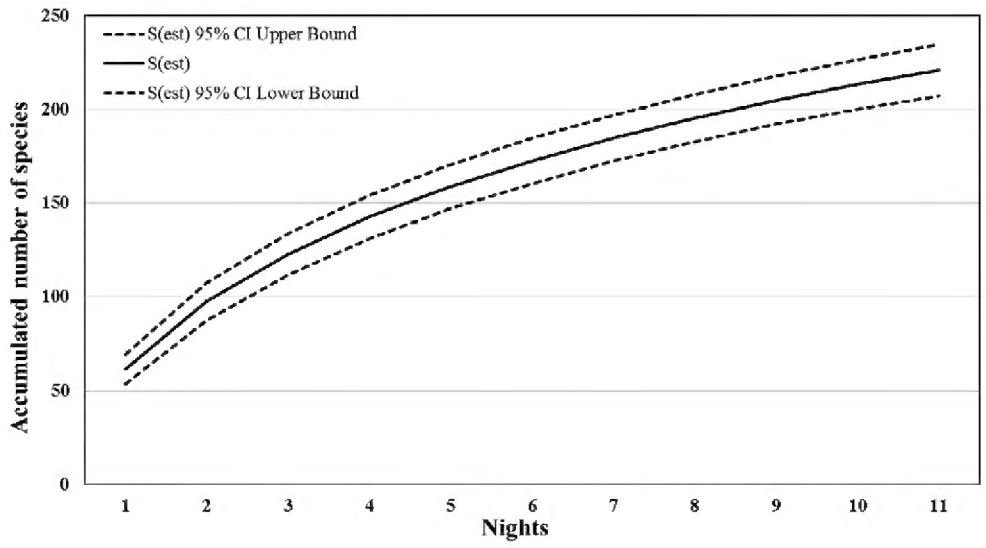

Figure 2. Rarefaction curve of Arctiini species in relation to sampling effort employed in the Serra do Pardo National Park from 22 September to 3 October 2011.

do Pardo National Park will contribute to an increased understanding of the lepidopteran biodiversity in the Amazon biome, which will serve as background knowledge to strategies for the conservation of the group and for the maintenance of the conservation status of the protected area.

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